SEQUENCE LISTING

<110> Zhou, Qun-Yong
      Cheng, Michelle Y.

<120> Screening and Therapeutic Methods
  Relating to Neurogenesis

<130> 66778-356

<150> US 60/416,202
<151> 2002-10-04

<160> 21

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 393
<212> PRT
<213> Homo sapiens

<400> 1

```
Met Glu Thr Thr Met Gly Phe Met Asp Asp Asn Ala Thr Asn Thr Ser
 1               5                  10                  15
Thr Ser Phe Leu Ser Val Leu Asn Pro His Gly Ala His Ala Thr Ser
            20                  25                  30
Phe Pro Phe Asn Phe Ser Tyr Ser Asp Tyr Asp Met Pro Leu Asp Glu
        35                  40                  45
Asp Glu Asp Val Thr Asn Ser Arg Thr Phe Phe Ala Ala Lys Ile Val
    50                  55                  60
Ile Gly Met Ala Leu Val Gly Ile Met Leu Val Cys Gly Ile Gly Asn
65                  70                  75                  80
Phe Ile Phe Ile Ala Ala Leu Val Arg Tyr Lys Lys Leu Arg Asn Leu
                85                  90                  95
Thr Asn Leu Leu Ile Ala Asn Leu Ala Ile Ser Asp Phe Leu Val Ala
            100                 105                 110
Ile Val Cys Cys Pro Phe Glu Met Asp Tyr Tyr Val Val Arg Gln Leu
        115                 120                 125
Ser Trp Glu His Gly His Val Leu Cys Thr Ser Val Asn Tyr Leu Arg
    130                 135                 140
Thr Val Ser Leu Tyr Val Ser Thr Asn Ala Leu Leu Ala Ile Ala Ile
145                 150                 155                 160
Asp Arg Tyr Leu Ala Ile Val His Pro Leu Arg Pro Arg Met Lys Cys
                165                 170                 175
Gln Thr Ala Thr Gly Leu Ile Ala Leu Val Trp Thr Val Ser Ile Leu
            180                 185                 190
Ile Ala Ile Pro Ser Ala Tyr Phe Thr Thr Glu Thr Val Leu Val Ile
        195                 200                 205
Val Lys Ser Gln Glu Lys Ile Phe Cys Gly Gln Ile Trp Pro Val Asp
    210                 215                 220
Gln Gln Leu Tyr Tyr Lys Ser Tyr Phe Leu Phe Ile Phe Gly Ile Glu
```

```
225                 230                 235                 240
Phe Val Gly Pro Val Val Thr Met Thr Leu Cys Tyr Ala Arg Met Thr
                245                 250                 255
Arg Glu Leu Trp Phe Lys Ala Val Pro Gly Phe Gln Thr Glu Gln Ile
            260                 265                 270
Arg Lys Arg Leu Arg Cys Arg Arg Lys Thr Val Leu Val Leu Met Cys
        275                 280                 285
Ile Leu Thr Ala Tyr Val Leu Cys Trp Ala Pro Phe Tyr Gly Phe Thr
    290                 295                 300
Ile Val Arg Asp Phe Phe Pro Thr Val Phe Val Lys Glu Lys His Tyr
305                 310                 315                 320
Leu Thr Ala Phe Tyr Ile Val Glu Cys Ile Ala Met Ser Asn Ser Met
                325                 330                 335
Ile Asn Thr Leu Cys Phe Val Thr Val Lys Asn Asp Thr Val Lys Tyr
            340                 345                 350
Phe Lys Lys Ile Met Leu Leu His Trp Lys Ala Ser Tyr Asn Gly Gly
        355                 360                 365
Lys Ser Ser Ala Asp Leu Asp Leu Lys Thr Ile Gly Met Pro Ala Thr
    370                 375                 380
Glu Glu Val Asp Cys Ile Arg Leu Lys
385                 390


<210> 2
<211> 384
<212> PRT
<213> Homo sapiens

<400> 2
Met Ala Ala Gln Asn Gly Asn Thr Ser Phe Thr Pro Asn Phe Asn Pro
 1               5                  10                  15
Pro Gln Asp His Ala Ser Ser Leu Ser Phe Asn Phe Ser Tyr Gly Asp
            20                  25                  30
Tyr Asp Leu Pro Met Asp Glu Asp Glu Asp Met Thr Lys Thr Arg Thr
        35                  40                  45
Phe Phe Ala Ala Lys Ile Val Ile Gly Ile Ala Leu Ala Gly Ile Met
    50                  55                  60
Leu Val Cys Gly Ile Gly Asn Phe Val Phe Ile Ala Ala Leu Thr Arg
65                  70                  75                  80
Tyr Lys Lys Leu Arg Asn Leu Thr Asn Leu Leu Ile Ala Asn Leu Ala
                85                  90                  95
Ile Ser Asp Phe Leu Val Ala Ile Ile Cys Cys Pro Phe Glu Met Asp
            100                 105                 110
Tyr Tyr Val Val Arg Gln Leu Ser Trp Glu His Gly His Val Leu Cys
        115                 120                 125
Ala Ser Val Asn Tyr Leu Arg Thr Val Ser Leu Tyr Val Ser Thr Asn
    130                 135                 140
Ala Leu Leu Ala Ile Ala Ile Asp Arg Tyr Leu Ala Ile Val His Pro
145                 150                 155                 160
Leu Lys Pro Arg Met Asn Tyr Gln Thr Ala Ser Phe Leu Ile Ala Leu
                165                 170                 175
Val Trp Met Val Ser Ile Leu Ile Ala Ile Pro Ser Ala Tyr Phe Ala
            180                 185                 190
```

```
Thr Glu Thr Val Leu Phe Ile Val Lys Ser Gln Glu Lys Ile Phe Cys
        195                 200                 205
Gly Gln Ile Trp Pro Val Asp Gln Gln Leu Tyr Tyr Lys Ser Tyr Phe
    210                 215                 220
Leu Phe Ile Phe Gly Val Glu Phe Val Gly Pro Val Val Thr Met Thr
225                 230                 235                 240
Leu Cys Tyr Ala Arg Ile Ser Arg Glu Leu Trp Phe Lys Ala Val Pro
                245                 250                 255
Gly Phe Gln Thr Glu Gln Ile Arg Lys Arg Leu Arg Cys Arg Arg Lys
            260                 265                 270
Thr Val Leu Val Leu Met Cys Ile Leu Thr Ala Tyr Val Leu Cys Trp
        275                 280                 285
Ala Pro Phe Tyr Gly Phe Thr Ile Val Arg Asp Phe Phe Pro Thr Val
    290                 295                 300
Phe Val Lys Glu Lys His Tyr Leu Thr Ala Phe Tyr Val Val Glu Cys
305                 310                 315                 320
Ile Ala Met Ser Asn Ser Met Ile Asn Thr Val Cys Phe Val Thr Val
                325                 330                 335
Lys Asn Asn Thr Met Lys Tyr Phe Lys Lys Met Met Leu Leu His Trp
            340                 345                 350
Arg Pro Ser Gln Arg Gly Ser Lys Ser Ser Ala Asp Leu Asp Leu Arg
        355                 360                 365
Thr Asn Gly Val Pro Thr Thr Glu Glu Val Asp Cys Ile Arg Leu Lys
    370                 375                 380


<210> 3
<211> 393
<212> PRT
<213> Mus musculus

<400> 3
Met Glu Thr Thr Val Gly Ala Leu Gly Glu Asn Thr Thr Asp Thr Phe
 1               5                  10                  15
Thr Asp Phe Phe Ser Ala Leu Asp Gly His Glu Ala Gln Thr Gly Ser
            20                  25                  30
Leu Pro Phe Thr Phe Ser Tyr Gly Asp Tyr Asp Met Pro Leu Asp Glu
        35                  40                  45
Glu Glu Asp Val Thr Asn Ser Arg Thr Phe Phe Ala Ala Lys Ile Val
    50                  55                  60
Ile Gly Met Ala Leu Val Gly Ile Met Leu Val Cys Gly Ile Gly Asn
65                  70                  75                  80
Phe Ile Phe Ile Thr Ala Leu Ala Arg Tyr Lys Lys Leu Arg Asn Leu
                85                  90                  95
Thr Asn Leu Leu Ile Ala Asn Leu Ala Ile Ser Asp Phe Leu Val Ala
            100                 105                 110
Ile Val Cys Cys Pro Phe Glu Met Asp Tyr Tyr Val Val Arg Gln Leu
        115                 120                 125
Ser Trp Glu His Gly His Val Leu Cys Ala Ser Val Asn Tyr Leu Arg
    130                 135                 140
Thr Val Ser Leu Tyr Val Ser Thr Asn Ala Leu Leu Ala Ile Ala Ile
145                 150                 155                 160
Asp Arg Tyr Leu Ala Ile Val His Pro Leu Arg Pro Arg Met Lys Cys
```

```
                165                 170                 175
Gln Thr Ala Ala Gly Leu Ile Phe Leu Val Trp Ser Val Ser Ile Leu
            180                 185                 190
Ile Ala Ile Pro Ala Ala Tyr Phe Thr Thr Glu Thr Val Leu Val Ile
        195                 200                 205
Val Glu Arg Gln Glu Lys Ile Phe Cys Gly Gln Ile Trp Pro Val Asp
    210                 215                 220
Gln Gln Phe Tyr Tyr Arg Ser Tyr Phe Leu Leu Val Phe Gly Leu Glu
225                 230                 235                 240
Phe Val Gly Pro Val Val Ala Met Thr Leu Cys Tyr Ala Arg Val Ser
                245                 250                 255
Arg Glu Leu Trp Phe Lys Ala Val Pro Gly Phe Gln Thr Glu Gln Ile
            260                 265                 270
Arg Arg Thr Val Arg Cys Arg Arg Arg Thr Val Leu Gly Leu Val Cys
        275                 280                 285
Val Leu Ser Ala Tyr Val Leu Cys Trp Ala Pro Phe Tyr Gly Phe Thr
    290                 295                 300
Ile Val Arg Asp Phe Phe Pro Ser Val Phe Val Lys Glu Lys His Tyr
305                 310                 315                 320
Leu Thr Ala Phe Tyr Val Val Glu Cys Ile Ala Met Ser Asn Ser Met
                325                 330                 335
Ile Asn Thr Leu Cys Phe Val Thr Val Arg Asn Asn Thr Ser Lys Tyr
            340                 345                 350
Leu Lys Arg Ile Leu Arg Leu Gln Trp Arg Ala Ser Pro Ser Gly Ser
        355                 360                 365
Lys Ala Ser Ala Asp Leu Asp Leu Arg Thr Thr Gly Ile Pro Ala Thr
    370                 375                 380
Glu Glu Val Asp Cys Ile Arg Leu Lys
385                 390


<210> 4
<211> 381
<212> PRT
<213> Mus musculus

<400> 4
Met Gly Pro Gln Asn Arg Asn Thr Ser Phe Ala Pro Asp Leu Asn Pro
 1               5                  10                  15
Pro Gln Asp His Val Ser Leu Asn Tyr Ser Tyr Gly Asp Tyr Asp Leu
            20                  25                  30
Pro Leu Gly Glu Asp Glu Asp Val Thr Lys Thr Gln Thr Phe Phe Ala
        35                  40                  45
Ala Lys Ile Val Ile Gly Val Ala Leu Ala Gly Ile Met Leu Val Cys
    50                  55                  60
Gly Ile Gly Asn Phe Val Phe Ile Ala Ala Leu Ala Arg Tyr Lys Lys
65                  70                  75                  80
Leu Arg Asn Leu Thr Asn Leu Leu Ile Ala Asn Leu Ala Ile Ser Asp
                85                  90                  95
Phe Leu Val Ala Ile Val Cys Cys Pro Phe Glu Met Asp Tyr Tyr Val
            100                 105                 110
Val Arg Gln Leu Ser Trp Ala His Gly His Val Leu Cys Ala Ser Val
        115                 120                 125
```

```
Asn Tyr Leu Arg Thr Val Ser Leu Tyr Val Ser Thr Asn Ala Leu Leu
    130                 135                 140
Ala Ile Ala Ile Asp Arg Tyr Leu Ala Ile Val His Pro Leu Lys Pro
145                 150                 155                 160
Arg Met Asn Tyr Gln Thr Ala Ser Phe Leu Ile Ala Leu Val Trp Met
                165                 170                 175
Val Ser Ile Leu Ile Ala Val Pro Ser Ala Tyr Phe Thr Thr Glu Thr
            180                 185                 190
Ile Leu Val Ile Val Lys Asn Gln Glu Lys Ile Phe Cys Gly Gln Ile
        195                 200                 205
Trp Ser Val Asp Gln Gln Leu Tyr Tyr Lys Ser Tyr Phe Leu Phe Val
    210                 215                 220
Phe Gly Leu Glu Phe Val Gly Pro Val Val Thr Met Thr Leu Cys Tyr
225                 230                 235                 240
Ala Arg Ile Ser Gln Glu Leu Trp Phe Lys Ala Val Pro Gly Phe Gln
                245                 250                 255
Thr Glu Gln Ile Arg Lys Arg Leu Arg Cys Arg Arg Lys Thr Val Leu
            260                 265                 270
Leu Leu Met Gly Ile Leu Thr Ala Tyr Val Leu Cys Trp Ala Pro Phe
        275                 280                 285
Tyr Gly Phe Thr Ile Val Arg Asp Phe Phe Pro Thr Val Val Val Lys
    290                 295                 300
Glu Lys His Tyr Leu Thr Ala Phe Tyr Val Val Glu Cys Ile Ala Met
305                 310                 315                 320
Ser Asn Ser Met Ile Asn Thr Ile Cys Phe Val Thr Val Lys Asn Asn
                325                 330                 335
Thr Met Lys Tyr Phe Lys Lys Met Leu Arg Leu His Trp Arg Pro Ser
            340                 345                 350
His Tyr Gly Ser Lys Ser Ser Ala Asp Leu Asp Leu Lys Thr Ser Gly
        355                 360                 365
Val Pro Ala Thr Glu Glu Val Asp Cys Ile Arg Leu Lys
    370                 375                 380


<210> 5
<211> 86
<212> PRT
<213> Homo sapiens

<400> 5
Ala Val Ile Thr Gly Ala Cys Glu Arg Asp Val Gln Cys Gly Ala Gly
 1               5                   10                  15
Thr Cys Cys Ala Ile Ser Leu Trp Leu Arg Gly Leu Arg Met Cys Thr
            20                  25                  30
Pro Leu Gly Arg Glu Gly Glu Glu Cys His Pro Gly Ser His Lys Val
        35                  40                  45
Pro Phe Phe Arg Lys Arg Lys His His Thr Cys Pro Cys Leu Pro Asn
    50                  55                  60
Leu Leu Cys Ser Arg Phe Pro Asp Gly Arg Tyr Arg Cys Ser Met Asp
65                  70                  75                  80
Leu Lys Asn Ile Asn Phe
                85
```

```
<210> 6
<211> 102
<212> PRT
<213> Homo sapiens

<400> 6
Ala Val Ile Thr Gly Ala Cys Asp Lys Asp Ser Gln Cys Gly Gly Gly
 1               5                  10                  15
Met Cys Cys Ala Val Ser Ile Trp Val Lys Ser Ile Arg Ile Cys Thr
            20                  25                  30
Pro Met Gly Lys Leu Gly Asp Ser Cys His Pro Leu Thr Arg Lys Asn
        35                  40                  45
Asn Phe Gly Asn Gly Arg Gln Glu Arg Arg Lys Arg Lys Arg Ser Lys
    50                  55                  60
Arg Lys Lys Glu Val Pro Phe Phe Gly Arg Arg Met His His Thr Cys
65                  70                  75                  80
Pro Cys Leu Pro Gly Leu Ala Cys Leu Arg Thr Ser Phe Asn Arg Phe
                85                  90                  95
Ile Cys Leu Ala Gln Lys
            100


<210> 7
<211> 81
<212> PRT
<213> Homo sapiens

<400> 7
Ala Val Ile Thr Gly Ala Cys Asp Lys Asp Ser Gln Cys Gly Gly Gly
 1               5                  10                  15
Met Cys Cys Ala Val Ser Ile Trp Val Lys Ser Ile Arg Ile Cys Thr
            20                  25                  30
Pro Met Gly Lys Leu Gly Asp Ser Cys His Pro Leu Thr Arg Lys Val
        35                  40                  45
Pro Phe Phe Gly Arg Arg Met His His Thr Cys Pro Cys Leu Pro Gly
    50                  55                  60
Leu Ala Cys Leu Arg Thr Ser Phe Asn Arg Phe Ile Cys Leu Ala Gln
65                  70                  75                  80
Lys



<210> 8
<211> 86
<212> PRT
<213> Mus musculus

<400> 8
Ala Val Ile Thr Gly Ala Cys Glu Arg Asp Ile Gln Cys Gly Ala Gly
 1               5                  10                  15
Thr Cys Cys Ala Ile Ser Leu Trp Leu Arg Gly Leu Arg Leu Cys Thr
            20                  25                  30
```

```
Pro Leu Gly Arg Glu Gly Glu Glu Cys His Pro Gly Ser His Lys Ile
        35                  40                  45
Pro Phe Leu Arg Lys Arg Gln His His Thr Cys Pro Cys Ser Pro Ser
    50                  55                  60
Leu Leu Cys Ser Arg Phe Pro Asp Gly Arg Tyr Arg Cys Phe Arg Asp
65                  70                  75                  80
Leu Lys Asn Ala Asn Phe
                85


<210> 9
<211> 81
<212> PRT
<213> Mus musculus

<400> 9
Ala Val Ile Thr Gly Ala Cys Asp Lys Asp Ser Gln Cys Gly Gly Gly
 1               5                  10                  15
Met Cys Cys Ala Val Ser Ile Trp Val Lys Ser Ile Arg Ile Cys Thr
            20                  25                  30
Pro Met Gly Gln Val Gly Asp Ser Cys His Pro Leu Thr Arg Lys Val
        35                  40                  45
Pro Phe Trp Gly Arg Arg Met His His Thr Cys Pro Cys Leu Pro Gly
    50                  55                  60
Leu Ala Cys Leu Arg Thr Ser Phe Asn Arg Phe Ile Cys Leu Ala Arg
65                  70                  75                  80
Lys



<210> 10
<211> 86
<212> PRT
<213> Rattus sp.

<400> 10
Ala Val Ile Thr Gly Ala Cys Glu Arg Asp Val Gln Cys Gly Ala Gly
 1               5                  10                  15
Thr Cys Cys Ala Ile Ser Leu Trp Leu Arg Gly Leu Arg Leu Cys Thr
            20                  25                  30
Pro Leu Gly Arg Glu Gly Glu Glu Cys His Pro Gly Ser His Lys Ile
        35                  40                  45
Pro Phe Phe Arg Lys Arg Gln His His Thr Cys Pro Cys Ser Pro Ser
    50                  55                  60
Leu Leu Cys Ser Arg Phe Pro Asp Gly Arg Tyr Arg Cys Ser Gln Asp
65                  70                  75                  80
Leu Lys Asn Val Asn Phe
                85


<210> 11
<211> 81
<212> PRT
```

```
<213> Rattus sp.

<400> 11
Ala Val Ile Thr Gly Ala Cys Asp Lys Asp Ser Gln Cys Gly Gly Gly
 1               5                  10                  15
Met Cys Cys Ala Val Ser Ile Trp Val Lys Ser Ile Arg Ile Cys Thr
            20                  25                  30
Pro Met Gly Gln Val Gly Asp Ser Cys His Pro Leu Thr Arg Lys Val
        35                  40                  45
Pro Phe Trp Gly Arg Arg Met His His Thr Cys Pro Cys Leu Pro Gly
    50                  55                  60
Leu Ala Cys Leu Arg Thr Ser Phe Asn Arg Phe Ile Cys Leu Ala Arg
65                  70                  75                  80
Lys



<210> 12
<211> 81
<212> PRT
<213> Dendroaspis polylepis

<400> 12
Ala Val Ile Thr Gly Ala Cys Glu Arg Asp Leu Gln Cys Gly Lys Gly
 1               5                  10                  15
Thr Cys Cys Ala Val Ser Leu Trp Ile Lys Ser Val Arg Val Cys Thr
            20                  25                  30
Pro Val Gly Thr Ser Gly Glu Asp Cys His Pro Ala Ser His Lys Ile
        35                  40                  45
Pro Phe Ser Gly Gln Arg Lys Met His His Thr Cys Pro Cys Ala Pro
    50                  55                  60
Asn Leu Ala Cys Val Gln Thr Ser Pro Lys Lys Phe Lys Cys Leu Ser
65                  70                  75                  80
Lys



<210> 13
<211> 77
<212> PRT
<213> Bombina variegata

<400> 13
Ala Val Ile Thr Gly Ala Cys Asp Lys Asp Val Gln Cys Gly Ser Gly
 1               5                  10                  15
Thr Cys Cys Ala Ala Ser Ala Trp Ser Arg Asn Ile Arg Phe Cys Ile
            20                  25                  30
Pro Leu Gly Asn Ser Gly Glu Asp Cys His Pro Ala Ser His Lys Val
        35                  40                  45
Pro Tyr Asp Gly Lys Arg Leu Ser Ser Leu Cys Pro Cys Lys Ser Gly
    50                  55                  60
Leu Thr Cys Ser Lys Ser Gly Glu Lys Phe Lys Cys Ser
65                  70                  75
```

<210> 14
<211> 77
<212> PRT
<213> Bombina maxima

<400> 14
```
Ala Val Ile Thr Gly Ala Cys Asp Arg Asp Val Gln Cys Gly Ser Gly
 1               5                  10                  15
Thr Cys Cys Ala Ala Ser Leu Trp Ser Arg Asn Ile Arg Phe Cys Val
            20                  25                  30
Pro Leu Gly Asn Asn Gly Glu Glu Cys His Pro Ala Ser His Lys Val
        35                  40                  45
Pro Tyr Asn Gly Lys Arg Leu Ser Ser Leu Cys Pro Cys Lys Ser Gly
    50                  55                  60
Leu Thr Cys Ser Lys Ser Gly Glu Lys Phe Gln Cys Ser
65                  70                  75
```

<210> 15
<211> 81
<212> PRT
<213> Homo sapiens

<400> 15
```
Ala Val Ile Thr Gly Ala Cys Glu Arg Asp Val Gln Cys Gly Ala Gly
 1               5                  10                  15
Thr Cys Cys Ala Ile Ser Leu Trp Leu Arg Gly Leu Arg Met Cys Thr
            20                  25                  30
Pro Leu Gly Arg Glu Gly Glu Glu Cys His Pro Gly Ser His Lys Val
        35                  40                  45
Pro Phe Phe Gly Arg Arg Met His His Thr Cys Pro Cys Leu Pro Gly
    50                  55                  60
Leu Ala Cys Leu Arg Thr Ser Phe Asn Arg Phe Ile Cys Leu Ala Gln
65                  70                  75                  80
Lys
```

<210> 16
<211> 86
<212> PRT
<213> Homo sapiens

<400> 16
```
Ala Val Ile Thr Gly Ala Cys Asp Lys Asp Ser Gln Cys Gly Gly Gly
 1               5                  10                  15
Met Cys Cys Ala Val Ser Ile Trp Val Lys Ser Ile Arg Ile Cys Thr
            20                  25                  30
Pro Met Gly Lys Leu Gly Asp Ser Cys His Pro Leu Thr Arg Lys Val
        35                  40                  45
Pro Phe Phe Arg Lys Arg Lys His His Thr Cys Pro Cys Leu Pro Asn
```

```
    50                  55                  60
Leu Leu Cys Ser Arg Phe Pro Asp Gly Arg Tyr Arg Cys Ser Met Asp
65                  70                  75                  80
Leu Lys Asn Ile Asn Phe
                85


<210> 17
<211> 1598
<212> DNA
<213> Homo sapiens

<400> 17
aataaataaa tagatgaata ctcgcaaaat cgtatgatgt aaatgctatt cttatcccat 60
gttatagata ggaaaactga ggcttggaga gattagcaat attttcaagg tcatgaagcc 120
atcgatctga atcaaagcat ctgcctctgg gggcttagct cccagctccc gtgctagtta 180
accttcctct ctgcactcat aaatgcctat cagcgtttca atgtggaaac cctagacccc 240
tgtgacattt gataagaaag gttttgtgga tgaatctgct tgtgaaatac tacaaactgc 300
atttcccact tggtgtttca aacacttatt agcatatgaa aggccctgaa aagttctgca 360
aaaaacaagc cggtttgtgt ttcccaaatt tttgactgta gaagtctttt atttgtttat 420
ttgtgtatta acatattgca acacatacct tgggaaatgt tggcttttat tactgtggag 480
agaaggcaga tcatctgaca aagcactggg agctctctct gggtcgtatg acacagagag 540
ggctggggtc aggggcttcc ctcacaggcg gaggggccat cccgaaagtc aacttcccac 600
cagactggca tctgagacca ccgtgtttat acactcacgg ataaggccac tctcatgctc 660
acccctaaaa ctggaaggcc agtggtgtgg ctctggtacc tttcagccac agcccatacc 720
agctcggctc tgcagggtac tgagagagtg tgtgccctgt atgtttgctg gctttctgcc 780
cttgggtcat tgtaccaagg gacacttgct ggtgttcatc ctgagcccat gagagagcaa 840
atccttatgt gtgtgtcact taggaacatc agccccacaa gtctggtctt tttttcctca 900
ctgtcttatg gctcctcact ataattttaa ccttttagag aaataaggat accacctcac 960
cctcttctgt cttctcagct acctctgtgt tgagcccatg gtaaatgcct agataagtct 1020
tggtgtgagt gagagggaac caataatctt gtatgttgca tagtttggtg cagggaagca 1080
taaatggtga tgttgcaaat cccttaattc attaccagag gctttcctct gccccaagta 1140
ggatagaagg atacccagag gcagaaaaga acattgagtg aaatatacat aactgtctga 1200
atcactgcgt tcttgggaga gttagagcaa ccgtcaaagc cccccaagta tccattttta 1260
ttggttttga tgttgatttg atgttgttag agattcaggt ctcatcttcg cttctgagat 1320
catctgagta acatcggtgt tggagaaggg aagagcagag atgaggcatc cacaggcagc 1380
cctggatcct gagtgtaaac atctgggagg aggcggggga tgcaggagag cctggcctcc 1440
ccagcttgcc aggcacaagg ctgagcggga ggaagcgaga ggcatctaag caggcagtgt 1500
tttgccttca ccccaagtga ccatgagagg tgccacgcga gtctcaatca tgctcctcct 1560
agtaactgtg tctgactgtg ctgtgatcac aggggtaa                         1598

<210> 18
<211> 7349
<212> DNA
<213> Mus musculus

<400> 18
acacaagaaa gaagagggaa gagtgttcta gaccatcctg aaagtagata gccatagatc 60
agtggcccag gctctgcact actgttctct ggcaagtcac atgtggaggc tcagaaacat 120
ctgagatttg tggaaacaag tttaaagatt gagtatatgg aatactccca ccaaattgct 180
gtgtcttact tctagttatt ggccacccaa ggtttttatg gcaatgttat aaatttgaag 240
agaaactcta acagttaaaa gcttggcacc agagcacact gggtttaaat ctagtttctt 300
tccttagcaa ttaccctggc ttgagatggc atggttgacc tttctaaatt ccactttgct 360
```

cttccataat ggccaagagt tctacccaga gggtccctgg ggtttttata gaagatgtac 420
tggaattcac aaagtactta ctgtgtgcaa cgcatagctc tgcacttttg aaatgaaaac 480
accacaattg gcttgtgccc caaaacaaag aaacaaaaca aaataaagct aggagtcata 540
atgtgaaccc tagttcccta gcaagcctcc tgcctcagct tcctgaatgc tgggatttca 600
agctaagagc caccacatct ggttataaaa gttttgtacc tattatttca tatgtatatg 660
aatatgtctt gttacttctt ctaggtcctt tccttcttta aatgttgctg aatgaggttt 720
atttcgctgt gatagatagt tcctgttgac ctgaaaggat gataaagtaa ctacctagtc 780
atggttttta atcttaagaa aacccctttc ttaggtgaga cttctttttt ttccatctgg 840
aaagttacca aatacgccac acatttgcat aacaatctct ttgaatgaag acagcagcgc 900
acgcagcacc agcttttgcc tttagggcca tcttcaatag aaaaaaaata aaaaaaataa 960
aaaagctgac agagaagagc agcgaacgtt ataatgagaa catctgaatc ttttagaacc 1020
aaatgttctt cggtgaccct tcatattatc tcaaagtcac ggtgtgctaa ttgcttgaag 1080
aaaacccttt ctccgggatt aatacttcag ctatttaaaa atagataaac tttactgtac 1140
attatcactt gaatggaaca aatgcttttc agtgcctccg tagacaattg gcgttcacat 1200
tgaatcctgg tgatttatta ttttttttta aataaagaga aaatcatcag cattgaacta 1260
gattaaaata gacatcttat ttagaattat aaaagccatt cctttttcat gtcacattta 1320
aaatacggtt attattttag aatgatagca cagatgatat tataggttta acaagaagag 1380
ccacgtggaa cagtgcctca ataaaggatg aaggcaaagt agaaaggaga atatccatct 1440
tatttcattt gacttttttt ttggaacaaa tctaaatgaa aagtcattta cacaaaggca 1500
aataaaaccc agtaatgaaa ttaccgggcc cacctattgt gttaccataa taagccataa 1560
gaaaaagacg catgcaaagt aaggtttcag caaagccaga gtcactctta acaacagagc 1620
catgtgagga agcgtctgga acagtttcct cttctgtggc tgagaaaatg cctgacactt 1680
tccgtgcaag atggagagca aggcctgtgt ttcttgatct ttctttgata acctcatcac 1740
tcttgatgaa gcatctactg tgtgctggat cattggaatc agttatagta aggttaatat 1800
gcaaaatagc aatcagtaag ccagaacttt gggcaatatc cgaaagtcca aaagaatgtg 1860
gattacatca gtgagttgga gtctgcgcag tacatctcac aggaagttca agcaaagaca 1920
gtggaggcaa gatcagtaag agtttgtaaa actgcagtat gagacagtac agagactcta 1980
ggctcttttt ttttttttaa acacatgaat ctagaaacaa cagagctgga aaatagccca 2040
gtcataagca caacaaacta atttgctcac taggacccaa tgtgaagcaa gccagactga 2100
tgggtggtat acacacatca tccactgtgt ttgttcacaa gaacccgtgc aaaataagct 2160
ggaccagcga tggtatagta tacacatatc atctcaggca gagacaggca gatctctggg 2220
gctcgctggc cagccaacct agcttacccg gtgagtccca ggcctagtga aagaccctat 2280
ctcagaaaag aaggtagaag gctcttgaag aatgtcagct ggggctgtcc cctggcctcc 2340
acatgcaaag acgcagtgtg tgcccacgaa tgcgcacaca cacacacaca caacgaggaa 2400
tcagcaagct ttctctacac tagcagatag aagatatttt ttggcttttc caatcatgtg 2460
gtctcacaag tactcagtaa aaagcagaca cgggcaatac agaaacaggc atggctagat 2520
agaacataaa aaataaataa tagatagata gatagataga tagatagata gatagataga 2580
tagatagata gaatactggc tagttttgtg tcaacttgac acagctggag ttatcacaga 2640
gaggggagct tcagttgggg aaatgcctcc atgagataca actgtaaggc attttctcaa 2700
ttagtgatca agagggaaag gccccttgtg ggtgggacca tctctgggct ggtagtcttg 2760
ggttctataa gagagcaggc tgagcaagcc aggggaagga agacagtaag taacatccct 2820
ccatggcctc tgcattagct tctgcttcct gacctgcttg agttccagtc ctgacttcct 2880
ttggtgatga agagcagtat ggaagtgtaa gccgaataaa ccctttcctc cccaacttgc 2940
ttcttggtca tcatgtttgt acaagaatag aaaccctgac taagacagat agatagacaa 3000
caaaaagcaa tgtgtcaacg ttttcccagt ttctactaaa tcctagtcat tgtggctaca 3060
ttctatgaaa tgaaaaaatt ttaaagtcca acaagaagcc actggttggc catttctttc 3120
tttagctcag ctgctccccc tcgccctgcc tgcctttgtc caatcccatg taagcaccag 3180
agtccctcct gcgagccagt taccacagtg aggttcctcc ttcctcccca ctcccaatag 3240
ttcctgccct tctttctctt gactgcccac aaggattctg cagtgctctg ccttcaggag 3300
atggatggtg acttctctca gtcctccatc atgctcttct ccacattcct agtgatttgg 3360
tcagccaaaa tcgagtgctt tgttcaattc ttggtacata gcttgtgctt agtaagtacc 3420
tgctgaatga gtgaatgaat gatggtctat tagttaaaac aaagcactct cagcttgcac 3480
atttgtactc tttcaccatg tatcacttga aggactaaac aaacaaatac agacacacat 3540

```
tatcctttgg agtaagaatt actaaggttg gccaaagtac agtggctcct ttcctgtagc 3600
actgcttacc agatttctgg tcttagcagc aactacattt gcactgctgt ctttagcaag 3660
gtgaactgtc acgtgacccg tttccgtcac tgtggcacag tcaggcttga gttccaggca 3720
gaggcagcag aaagctgaat tgcaaccctc cagccccacc cttcctttta gtttcccaga 3780
ggttctagga gaagtgagca gaactaggtg gcatcgcaca tcagaggtta ttttcttgta 3840
gctctggatg ttagaagtcc aaaatcaagg atgctttccc cagctcttct gaattctgaa 3900
agccagctgt gggggaggag gtgtgtcata tcagtctcta tatccaaaga tcttgcatct 3960
gttataaaaa gatgggaaaa tagcttagtc agcaaagggc ttgcctcgaa aacattgatg 4020
tcctgagttc agtctccaga actcaaaaaa gccaggtgcg gtgacttgag tctgtggcta 4080
cctgagtctg taatcccaac aatggtaaaa tgggaggccg aggcaggcag atttcctgag 4140
gctcacagga cagtgaggct gacctacatg tcaaagttcc agtctagtga gagaccctgt 4200
cccaaacaaa aggtagaagc cgtctggtac tcaaggttgt ctgacctgca catatgctgt 4260
gtgtagaggt gcccacacat acacaaatgc atactcatgc atgcacagac acacacacac 4320
acaaaaccac actttttaaa aaaaatgaca aagatatcag ttgttgggtt tagggcatac 4380
tctcatccag tatgacttca agtttggttg atcatatcag caaggaccct acttccaaat 4440
aaagacacag gaaccaggag ctagagtttc aacataactt tctaggtgag acttagtata 4500
accctagtct ggaatcatca taaatcatca gttcaaataa agtccccctc agctgagctc 4560
ccagagtgcc tgctgtagct tgaatgtgtg acagctgtaa gacatgtctc caggggcccc 4620
tcattccagt cccatattct tggaggaaac agcaggcgaa tcccctgcac caggtctctc 4680
tttccctcta agcttttgct gcctgcattc gtgatccatg tagattaagt aagtgcatct 4740
acactgtgtg attcttgctt ctaacctctc tctgtccctg atcacaaaat ccactcctgg 4800
tgctcatcaa tcattgtctg agtgctggct aatgccacat gcaagaagga ttttcaggag 4860
aaatggactc ctagccagca cgtgtatgcg atctaattag gtgggcagga cagaaaacag 4920
ccgtatcagt gttcaatgaa cctatcaggg aaaagcacat gataagattt aactagagtg 4980
cacccccttg caggacttcc aggctatcac agacttggtg cttagcactt tcaaaggtgt 5040
tctctttgag cttcatggtg gctggaccag gaagttggta ttttatgccc acagggagcc 5100
agagacctta agaggtcaaa ggttcagttg ccacaaaaga ctccaatcca ggtcactcta 5160
actttcaaat gtagggttct tcgtatcaca ctgtcaaacc agctgagagg tggtagtcat 5220
gcaagactgc cagctatata tactctgaac ccacgaagtt ttggtcctca cccaaaggtt 5280
gttcctggct aatttgacca caatgactga tcgaaccaac aggttgcagt aacaaaacag 5340
aacttgaatt tcattattgt tttatcgttg tcttacggtg gggaggagtg taattcaaac 5400
agtgtctttc catttctaat aaatgaaatc agacttgatc taacttacct gtggggtcca 5460
aagaagttct gttgaagagt tttcatttct tctatcaagt attaaagcca ttaaaccctt 5520
ccaaagaggt ttagggggta gccgagcagt agaattgacc caggatgtcc atgcccttgg 5580
ttgcaacctc agcacaggaa aacagaagag ccttaaacca gtcttatgtt taagcatctc 5640
taaccttgat tcaaaagtct taggagactg ttttgggaac agtcaatctc aatggaaggt 5700
tagcatttcc ctgggtagag atggcctgtt ttctacgctc tgagaagtag ggaataccca 5760
gttggcattt gatagtaaca aatatgaaac cgaccattta agaaaagaat taaaagagtg 5820
tcaggaatgt taaagttcat gttgactggt ttttacattt cccccgggct gcactcccat 5880
gccttcgttg gcatggagac tggaaaggaa actttccacc agtctgtcac ttgctactgt 5940
ttccacttag tttactgtga atccactttt aacagttttc tcaaagttaa aaaggagttt 6000
gatcccgggt gtgttttcgg tctcaggatg cttcttgaac tcaaaaacat ggtacaaaaa 6060
ggctttaaaa ctcagccaaa gatctagggt ttgaaacgcc cagctgttta acattcaaat 6120
aattccctgg ccctttgttc atttttttc ccctctacat ttcgtctgaa tgctttggca 6180
tgagggagcc cacagactga aagtaactgt ggcccagctc tccttactgt attgattaaa 6240
gtggctgaaa aggcccatct gcctttcagc agtctgtggt cctatgggac atgggaaagt 6300
ctaaggtccc tagctgtcta ggagtgaggt gggctccccc aaacctcaga aaaagtcaaa 6360
ttgatcatcc ttgtagaagc aagcaagatg agattattgg agccaaatta ggaacacaga 6420
gagggttgtc tcttgtctca tgggatgaat gcctagagtc cagcagacac acctaagtga 6480
ttgatcagaa cccccaccac caccaccaaa aaaaaatata tatatatgta taagacttgg 6540
agtttcctag gctggagaac cgagctggga gagagccacc ttcccagggc ctcaggctgg 6600
cagagcaagc tgggagttct cctttttcc cccttggca acatcctgtt ctgcctgaag 6660
caggctggaa gctgcagagg ggagggaacg cacgtgagag aaatcagggc agaaagggtc 6720
```

```
aggaacagat gtgggcaccg gagaagtcat ttccaaaaag gaaaggagac tcccacagct 6780
ggagggggcag ccgagtccct ccaacttctt aagagatgtg ggacggggtg tgctggcgct 6840
ttgttcttcc agcctgctat gttcgcttgc cctttgcttg tttgtctgtt ctttctatgt 6900
tgtgccacct cagggcagag ccggtggcag tacctggcac gcacggatct ctcactgtag 6960
atatgctgaa caaatgtgta caaatacagt gcagttgtgt ccgccgcgtc tggcacgtcg 7020
tgggtacccc ctgcacatct gtatggcaaa tgatgtgcct ctgcgagtgt gggggctgag 7080
cacgtgaggc tctggaaaac aggacggcga aggaggaggg tttctgagac cacaaaagct 7140
tcaggaaggc tggctagggc tgcggcgccc cgcgggggct ctgcccgcgt ggcgctttgc 7200
gcgtggggcg cggggcacgt gcgcgtgtgc gcgtggagcg cggggtgtgt gcccgcgccg 7260
tgcccccgc gtgctgcctg gcgtgagtca ccgcggggct cgcctttata accgccgcca 7320
ggctcgcagc tccgcagagc agcccggcc                                    7349
```

<210> 19
<211> 2800
<212> DNA
<213> Mus musculus

<400> 19

```
cagctgagct cccagagtgc ctgctgtagc ttgaatgtgt gacagctgta agacatgtct 60
ccaggggccc ctcattccag tcccatattc ttggaggaaa cagcaggcga atcccctgca 120
ccaggtctct ctttccctct aagcttttgc tgcctgcatt cgtgatccat gtagattaag 180
taagtgcatc tacactgtgt gattcttgct tctaacctct ctctgtccct gatcacaaaa 240
tccactcctg gtgctcatca atcattgtct gagtgctggc taatgccaca tgcaagaagg 300
attttcagga gaaatggact cctagccagc acgtgtatgc gatctaatta ggtgggcagg 360
acagaaaaca gccgtatcag tgttcaatga acctatcagg gaaaagcaca tgataagatt 420
taactagagt gcaccccctt gcaggacttc caggctatca cagacttggt gcttagcact 480
ttcaaaggtg ttctctttga gcttcatggt ggctggacca ggaagttggt attttatgcc 540
cacagggagc cagagacctt aagaggtcaa aggttcagtt gccacaaaag actccaatcc 600
aggtcactct aactttcaaa tgtagggttc ttcgtatcac actgtcaaac cagctgagag 660
gtggtagtca tgcaagactg ccagctatat atactctgaa cccacgaagt tttggtcctc 720
acccaaaggt tgttcctggc taatttgacc acaatgactg atcgaaccaa caggttgcag 780
taacaaaaca gaacttgaat ttcattattg ttttatcgtt gtcttacggt ggggaggagt 840
gtaattcaaa cagtgtcttt ccatttctaa taaatgaaat cagacttgat ctaacttacc 900
tgtggggtcc aaagaagttc tgttgaagag ttttcatttc ttctatcaag tattaaagcc 960
attaaaccct tccaaagagg tttagggggt agccgagcag tagaattgac ccaggatgtc 1020
catgcccttg gttgcaacct cagcacagga aaacagaaga gccttaaacc agtcttatgt 1080
ttaagcatct ctaaccttga ttcaaaagtc ttaggagact gttttgggaa cagtcaatct 1140
caatggaagg ttagcatttc cctgggtaga gatggcctgt tttctacgct ctgagaagta 1200
gggaataccc agttggcatt tgatagtaac aaatatgaaa ccgaccattt aagaaaagaa 1260
ttaaaagagt gtcaggaatg ttaaagttca tgttgactgg tttttacatt tcccccgggc 1320
tgcactccca tgccttcgtt ggcatggaga ctggaaagga aactttccac cagtctgtca 1380
cttgctactg tttccactta gtttactgtg aatccacttt taacagtttt ctcaaagtta 1440
aaaaggagtt tgatcccggg tgtgttttcg gtctcaggat gcttcttgaa ctcaaaaaca 1500
tggtacaaaa aggctttaaa actcagccaa agatctaggg tttgaaacgc ccagctgttt 1560
aacattcaaa taattccctg gccctttgtt cattttttt cccctctaca tttcgtctga 1620
atgctttggc atgagggagc ccacagactg aaagtaactg tggcccagct ctccttactg 1680
tattgattaa agtggctgaa aaggcccatc tgcctttcag cagtctgtgg tcctatggga 1740
catgggaaag tctaaggtcc ctagctgtct aggagtgagg tgggctcccc caaacctcag 1800
aaaaagtcaa attgatcatc cttgtagaag caagcaagat gagattattg gagccaaatt 1860
aggaacacag agagggttgt ctcttgtctc atggatgaa tgcctagagt ccagcagaca 1920
cacctaagtg attgatcaga acccccacca ccaccaccaa aaaaaaatat atatatatgt 1980
```

ataagacttg gagtttccta ggctggagaa ccgagctggg agagagccac cttcccaggg 2040
cctcaggctg gcagagcaag ctgggagttc tcctttttc cccctttggc aacatcctgt 2100
tctgcctgaa gcaggctgga agctgcagag gggagggaac gcacgtgaga gaaatcaggg 2160
cagaaagggt caggaacaga tgtgggcacc ggagaagtca tttccaaaaa ggaaaggaga 2220
ctcccacagc tggaggggca gccgagtccc tccaacttct taagagatgt gggacggggt 2280
gtgctggcgc tttgttcttc cagcctgcta tgttcgcttg ccctttgctt gtttgtctgt 2340
tctttctatg ttgtgccacc tcagggcaga gccggtggca gtacctggca cgcacggatc 2400
tctcactgta gatatgctga acaaatgtgt acaaatacag tgcagttgtg tccgccgcgt 2460
ctggcacgtc gtgggtaccc cctgcacatc tgtatggcaa atgatgtgcc tctgcgagtg 2520
tgggggctga gcacgtgagg ctctggaaaa caggacggcg aaggaggagg gtttctgaga 2580
ccacaaaagc ttcaggaagg ctggctaggg ctgcggcgcc ccgcgggggc tctgcccgcg 2640
tggcgctttg cgcgtggggc gcggggcacg tgcgcgtgtg cgcgtggagc gcggggtgtg 2700
tgcccgcgcc gtgcccccg cgtgctgcct ggcgtgagtc accgcggggc tcgcctttat 2760
aaccgccgcc aggctcgcag ctccgcagag cagcccggcc 2800

<210> 20
<211> 4038
<212> DNA
<213> Homo sapiens

<400> 20
tcccatgaga tggtaagctc ccaggggct gggttcatgt ctgttttgct caccctcgta 60
cccccaatgc tgcacacaat atctggaata tagtaagtct tagttaatac ctgttgaatg 120
aataaattat ggtttctac ccacctaaaa gaaaatatta gcttacacat ttactcactt 180
tcagagtctt tgtataattc tggtataaag aatgctgtac tagaaaaaat acaaaggaaa 240
ttacacatta ttatttataa tagcaattac taatataatt caaagttcat tatgctcatt 300
aaggagtcca agccatgaat gattcatttc ctgtagaata tagcactgct cacctgatac 360
cttgttgtct tcagaaacca gtgacagact tgcactgtct gtcccttga agacagattg 420
tcatgtggct tgttttggtc actaaaaagt gagcaaaagt gacaggcatg aattccaggc 480
agagaaagct ggtgtacaac cctctggctg cacccaacta tgttagtttc ctgtgtctgc 540
cataatgaaa tcaccacaac tgggtggctt aaaacaatag aaacttattc tttcgtggtt 600
ctggaggcta aaagtccaaa accaaggggc tgacaaggcc gtgctccctg tgaaggatct 660
ggggaagaat ccttccttgc tctttcagat cctgatggct gctggcaatc cttggtgttc 720
cttgccttgt agaagcattg ctccaatctc tgccccatc ttcacttgat gttctcccgt 780
gtgtgtgggg ggggtggggt ggggggagtc tagcctgtgt ctctgtatcc agctctccct 840
cccatttctc ttatgaagac accagccatt gaatttagaa cccaccctaa tatagcatga 900
cctcatctta agttgattac gtctgcaaaa accctatttc caaataaggt cacgtccaca 960
ggtaccaggg cttaggcctt gaaaataact tgctaggggt cacagtatag gccactacac 1020
tggcaatcat gaagcacatg ttgaaatgga gccttatcag tcagcctgag tcccaaattg 1080
actgccgtga gacaggcctg tgtctcccag ctcacttcat ttcagtcacg tggccccaa 1140
gtaaagagac aggctgaatc atctgcacca ggtaaagctt ccatctctct tgcttttgg 1200
tgactacctt taacggattc atatacatga catgagtctg tactgtatat gatcttctcg 1260
taactgtctc tggactgtcc ttcatgggac atattcctgt tgctggtcac ttactgaatg 1320
cctgccatat gcctattatc gtgctgtgtg ccaagaggga tgcatagaaa attagacaca 1380
aggatcctaa tcatgaaaag tgtacaatct aatatagtgg gcaggacaga aaagacttat 1440
atcagcattg gctgaaattg tcaggggaga ccaaataata aggcttaata agaggtaacc 1500
ctaacagagc tcccagtctg ttccaggcac tgtgataagc attttgcagg tattattaaa 1560
ttccataggg gttgtacccc atgaggttgg tattttataa ccattttaca agaccggaaa 1620
cagaggcttc aaaaggttgt gtaacttgcc cagtggtcac acaggattcc aatcctgatc 1680
agcctgtctc acaaacattg ggttctatag acgctcctag attgcatttt cgtttaagct 1740
gagccttgat ggtctgctgg aatatggtag gctacacttt acacacacaa ggctcatttc 1800
acctaataca gttatgcctg ggcagaagtg atcatgtggc aatatcaaca ggttacagta 1860
atagaaaaga atcaataaac tactgtttca tttctatgtc attgttgcta agttgtccca 1920

actacctttt ttaatggact aatccaaact cttttttttt ttcattttc cctttataac 1980
aattgaagtc agacttcatt tttcaaactt ggcctcagat acaaagatga catatcaaga 2040
gccttcattt ctctcctaaa gcattaaagc aattaaaatt tccaaaagaa catgaaacta 2100
aacaacccta tttttaagtg tttccaaact tatttctttt ttttaaactt gtttcaaaac 2160
agccttatga ggactgtttt ccaaacagct gtgtaagaag ccagccactt ttgaaatctg 2220
atttttcctg tgtagacata tcatattttc tatgcttgaa gaagcaggga atacccaagc 2280
tggcattcaa tagtagcgaa tatgaaatag accattaaaa gaaagtcata ggaatgttaa 2340
aatccatgtt gactggtttt tacatttacc cggcagcatt cccgagctag cgttggcatg 2400
gagactggaa aaggaaactt tccacaagtc tgtcacttgc tactgtttct acttactcca 2460
ctgtgagtcc aattttaaca ttttttaag ttgaaaaaag ggtttgactc cttttgtgtt 2520
ttctgttcaa ggcgtttttt aaacatgaga acacgtgtga aaaaggtttt taaaaatcag 2580
ccaaagattg gggtttccaa atattcagct gtttaacatt cagataattg cctgccttcc 2640
ccccgctatc ccccacattt cgtctgaatg ctttggcacg ggggagcccc acagtctgaa 2700
agtaactctg tcccaactct ccttactgca tttattaaag aggctgaaag acgcatctgc 2760
ttttcaatag tttgcggttc ttaagagacc aggaaagcca gaggttctga ctattcagga 2820
agaaagttgg gtttcccaaa acgggcaagc aagttcggtg tggtcacatc taggtattct 2880
tgacgtcatt tttgttgagg gaaacaggct gcagtttttg gagccaggct aggatgagag 2940
atggagggca aatctgtcac ttattctttc ctggtgtgcc tggaacccac tagacactca 3000
attcatgttt acgtgaatga aggaatcaca ataacgccct atcgcatctg taaaaccgaa 3060
gggtgatttt cctgggctgg aaagtttaag aaagaagaga gagctgcgta cctagggctt 3120
aaggggcctc aggctggcac tcgaaaccag gcgttctcat ttccctttgg catcaccctg 3180
aacggctgtg cctggagctg gcgcggggct gaagagggga ggaaatacat gtgaggaaaa 3240
tcagaggaga gggtcgggaa cagatgtggg cataaaggga aggcctctga cttgaaataa 3300
acaaatagga gtcccgcagc tggaaggaca aatcctttca cgtcgcgggt gatgtgggat 3360
tggggcgatt ttgctctccc tttgttcttt cccctgcctt ccacgtttcc agggtatttg 3420
attgatgtct gtcttctctg ttaagttatt ccaccgtgag gagagagccg gtggcagtac 3480
ctggcacgca gcgggcgccc agtatagacc tgctgaacaa acgaatggat tcagggggctg 3540
ctgtgtcccc ctcacccacc ccccgccccc tatgtgtcca cagcgccccg cacgtagtag 3600
gcgaccccta aacatctgta cagcaaatga tttgcaagtt ttcggcgctg agcacgtgga 3660
gctttggaaa ccaggacagc aaatgagtgt ctcggagacc acaaaagcgg ttccggcgcg 3720
tgcgaaaggc ggtggctggg cgacggcgga gggaacggcg cagagcgggg cgccccgccg 3780
ggagcgctgc ctgcgtggcg cccgaggcgg gggcgcgggg ggccgcgcat agcacgtgct 3840
cgtctgggag ccggccgggc cgaggcgggc gcgcgtgtgc gcgtggggcg tggggtgtgt 3900
gcccgcgccg tgccccccgc gtgtgctgcc gggcgggcgc cggcgtgagt cacggcgggg 3960
ctagccttta taacggcccg gaggctcgcg ggagccgccg cgcccgtccg cccgccgctc 4020
cgcgctccac ccagcgca 4038

<210> 21
<211> 2800
<212> DNA
<213> Homo sapiens

<400> 21
tgtactgtat atgatcttct cgtaactgtc tctggactgt ccttcatggg acatattcct 60
gttgctggtc acttactgaa tgcctgccat atgcctatta tcgtgctgtg tgccaagagg 120
gatgcataga aaattagaca caaggatcct aatcatgaaa agtgtacaat ctaatatagt 180
gggcaggaca gaaaagactt atatcagcat tggctgaaat tgtcagggga gaccaaataa 240
taaggcttaa taagaggtaa ccctaacaga gctcccagtc tgttccaggc actgtgataa 300
gcattttgca ggtattatta aattccatag gggttgtacc ccatgaggtt ggtattttat 360
aaccatttta caagaccgga aacagaggct tcaaaaggtt gtgtaacttg cccagtggtc 420
acacaggatt ccaatcctga tcagcctgtc tcacaaacat tgggttctat agacgctcct 480
agattgcatt ttcgtttaag ctgagccttg atggtctgct ggaatatggt aggctacact 540
ttacacacac aaggctcatt tcacctaata cagttatgcc tgggcagaag tgatcatgtg 600

```
gcaatatcaa caggttacag taatagaaaa gaatcaataa actactgttt catttctatg 660
tcattgttgc taagttgtcc caactacctt ttttaatgga ctaatccaaa ctcttttttt 720
ttttcatttt tccctttata acaattgaag tcagacttca tttttcaaac ttggcctcag 780
atacaaagat gacatatcaa gagccttcat ttctctccta aagcattaaa gcaattaaaa 840
tttccaaaag aacatgaaac taaacaaccc tatttttaag tgtttccaaa cttatttctt 900
tttttaaac ttgtttcaaa acagccttat gaggactgtt ttccaaacag ctgtgtaaga 960
agccagccac ttttgaaatc tgatttttcc tgtgtagaca tatcatattt tctatgcttg 1020
aagaagcagg gaatacccaa gctggcattc aatagtagcg aatatgaaat agaccattaa 1080
aagaaagtca taggaatgtt aaaatccatg ttgactggtt tttacattta cccggcagca 1140
ttcccgagct agcgttggca tggagactgg aaaaggaaac tttccacaag tctgtcactt 1200
gctactgttt ctacttactc cactgtgagt ccaattttaa catttttta agttgaaaaa 1260
agggtttgac tccttttgtg ttttctgttc aaggcgtttt ttaaacatga gaacacgtgt 1320
gaaaaaggtt tttaaaaatc agccaaagat tggggtttcc aaatattcag ctgtttaaca 1380
ttcagataat tgcctgcctt ccccccgcta tcccccacat ttcgtctgaa tgctttggca 1440
cgggggagcc ccacagtctg aaagtaactc tgtcccaact ctccttactg catttattaa 1500
agaggctgaa agacgcatct gcttttcaat agtttgcggt tcttaagaga ccaggaaagc 1560
cagaggttct gactattcag gaagaaagtt gggtttccca aaacgggcaa gcaagttcgg 1620
tgtggtcaca tctaggtatt cttgacgtca tttttgttga gggaaacagg ctgcagtttt 1680
tggagccagg ctaggatgag agatggaggg caaatctgtc acttattctt tcctggtgtg 1740
cctggaaccc actagacact caattcatgt ttacgtgaat gaaggaatca caataacgcc 1800
ctatcgcatc tgtaaaaccg aagggtgatt ttcctgggct ggaaagttta agaaagaaga 1860
gagagctgcg tacctagggc ttaaggggcc tcaggctggc actcgaaacc aggcgttctc 1920
atttcccttt ggcatcaccc tgaacggctg tgcctggagc tggcgcgggg ctgaagaggg 1980
gaggaaatac atgtgaggaa aatcagagga gagggtcggg aacagatgtg ggcataaagg 2040
gaaggcctct gacttgaaat aaacaaatag gagtcccgca gctggaagga caaatccttt 2100
cacgtcgcgg gtgatgtggg attggggcga ttttgctctc cctttgttct ttcccctgcc 2160
ttccacgttt ccagggtatt tgattgatgt ctgtcttctc tgttaagtta ttccaccgtg 2220
aggagagagc cggtggcagt acctggcacg cagcgggcgc ccagtataga cctgctgaac 2280
aaacgaatgg attcaggggc tgctgtgtcc ccctcaccca ccccccgccc cctatgtgtc 2340
cacagcgccc cgcacgtagt aggcgacccc taaacatctg tacagcaaat gatttgcaag 2400
ttttcggcgc tgagcacgtg gagctttgga aaccaggaca gcaaatgagt gtctcggaga 2460
ccacaaaagc ggttccggcg cgtgcgaaag gcggtggctg ggcgacggcg gagggaacgg 2520
cgcagagcgg ggcgccccgc cgggagcgct gcctgcgtgg cgcccgaggc gggggcgcgg 2580
ggggccgcgc atagcacgtg ctcgtctggg agccggccgg gccgaggcgg gcgcgcgtgt 2640
gcgcgtgggg cgtgggggtgt gtgcccgcgc cgtgcccccc gcgtgtgctg ccgggcgggc 2700
gccggcgtga gtcacggcgg ggctagcctt tataacggcc cggaggctcg cgggagccgc 2760
cgcgcccgtc cgcccgccgc tccgcgctcc acccagcgca                       2800
```